

Trend Study 19B-4-07

Study site name: Harker Canyon .

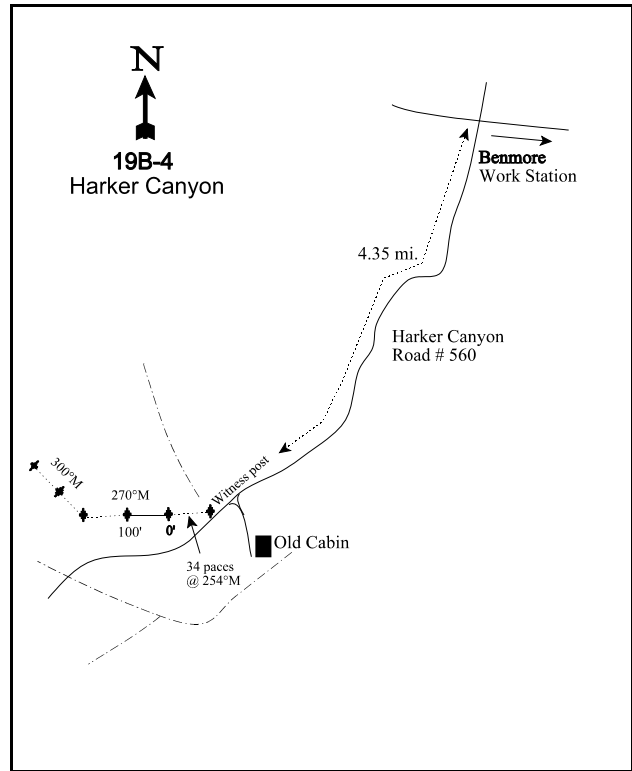
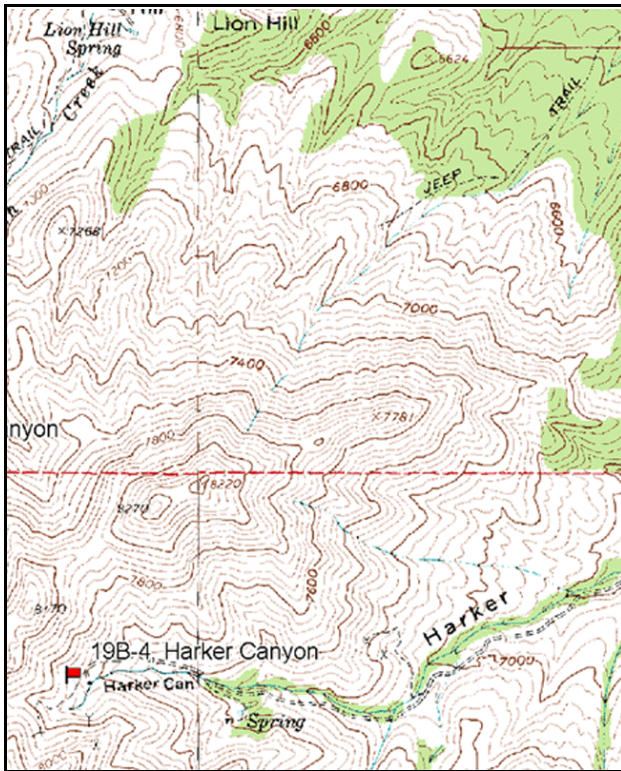
Vegetation type: Snowberry .

Compass bearing: frequency baseline 270 degrees magnetic (Line 3-4 @ 300°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 3 on 7ft, belt 4 on 1ft, and belt 5 on 1ft.

LOCATION DESCRIPTION

From the Forest Service's Benmore Work Station, proceed south 0.10 miles to a "T" intersection. Turn right at the intersection (west) for 2.0 miles to an intersection and a sign for "Harker Canyon." Turn left, heading southwest towards Harker Canyon for 4.35 miles. Just after passing an old cabin on the lefthand side of the road, look for a half high green steel "T" fencepost with a white top on the right side of the road (northeast). From the fencepost the 0-foot stake of the baseline is 34 paces away at an azimuth of 245 degrees magnetic. The study is marked by green steel "T" fenceposts approximately 12-18 inches in height.



Map Name: Erickson Knoll

Diagrammatic Sketch

Township 10S , Range 6W , Section Unsurveyed (3)

GPS: NAD 83, UTM 12S 371356 E 4426183 N

DISCUSSION

Harker Canyon - Trend Study No. 19B-4

Study Information

This study samples deer summer range located near the upper end of Harker Canyon on Forest Service land [elevation: 7,700 feet (2,347 m), slope: 35%, aspect: east]. The vegetation is dominated by mountain brush and there is a perennial water source about 150 yards (137 m) to the south. Nearby, in Harker Canyon, scattered aspen and tall brush thickets provide resting and escape cover during the summer. In 1983, two mature bucks and one doe were observed, and there was a moderate number of deer pellet groups and cattle pats. Only a few deer and elk pellet groups were observed in 1997. During 2002 and 2007, several deer were seen nearby, including a couple of small bucks. From the pellet group transect there were an estimated 40 deer days use/acre (99 ddu/ha) in 2002 and 25 deer days use/acre (63 ddu/ha) in 2007. Elk use was estimated at 1 day use/acre (2 edu/ha) in 2002 and 2007. Cattle use was estimated at 10 days use/acre (25 cdu/ha) in 2002 and 5 days use/acre (13 cdu/ha) in 2007. The majority of deer and elk pellets sampled appeared to be from spring and early summer, and cattle pats were from late summer. Additionally, there were off-road vehicle tracks traversing the study in 2007.

Soil

The study lies within the Podmor-Onaqui-Rock outcrop association, and generally consists of shallow to moderately deep, well-drained soil. Soil depths were 10-23 inches (25-58 cm). Soils in this series formed in colluvium and residuum derived predominantly from quartzite, and are found on mountainsides and ridges (USDA-NRCS 2007). Specifically at the study, soil is coarse and rocky. The soil has a loam texture and a moderately acidic reactivity (pH of 6.0). Relative vegetation cover was 45% in 1997, decreased to 35% in 2002, and increased to 46% in 2007. Relative bare ground soil increased from 2% in 1997 to 20% in 2002, and decreased to 16% in 2007. The decrease in vegetation cover and the increase in bare ground cover in 2002 is likely the result of a region-wide drought (Utah Climate Surveys 2007). It was reported in the past that erosion was negligible as there was little bare ground and abundant vegetation and litter cover. Most signs of erosion occurred on animal trails that zig-zag through the area. Both surface litter and soil movement were noted in 2002. The erosion condition has been on the threshold between stable and slight since 2002.

Browse

The vegetative community is dominated by the browse component. The three most abundant browse species are mountain snowberry (*Symphoricarpos oreophilus*), Saskatoon serviceberry (*Amelanchier alnifolia*), and mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*). Snowberry canopy cover was 26% in 2002 and increased to 33% in 2007. The estimated snowberry density increased from 1,000 plants/acre (2,475 plants/ha) in 1983 to 3,000 plants/acre (7,426 plants/ha) in 2002, then decreased to 2,480 plants/acre (6,140 plants/ha) in 2007. Nearly 90% of the sampled plants have been classified as mature since 1997. Decadence has increased from 2% of the population in 1997 to 12% in 2007. In 2002 and 2007, few seedling or young plants were sampled, and plants with poor vigor comprised 24% and 16% of the population, respectively. The majority of plants with poor vigor were chlorotic and dropping leaves. Browse use has been light, though in 2002 crickets were observed feeding on snowberry leaves.

Serviceberry canopy cover was 6% in 2002 and increased to 8% in 2007. The serviceberry density has oscillated between increasing and decreasing in alternate sample years. The estimated density has fluctuated between a low of 333 plants/acre (824 plants/ha) in 1983 to a high of 1,266 plants/acre (3,137 plants/ha) in 1989. In 2007, there were an estimated 500 plants/acre (1,238 plants/ha). No serviceberry seedlings have been measured in any year. Young plants comprised 11% of the population in 1989 and 1997, 5% in 2002, and 16% in 2007. Decadence was highest in 1989 at 26% and has been from 0% to 12% all other sample years. Vigor was good all sample years except for 2002, when 38% of the population displayed poor vigor. The increase in poor vigor was likely the result of the region-wide drought (Utah Climate Summaries 2007).

As with mountain snowberry, a combination of leaf drop due to drought and browsing by crickets resulted in plants being categorized as having reduced vigor. Annual leader growth on serviceberry averaged 1.9 inches (4.8 cm) in 2002 and 4.1 inches (10.5 cm) in 2007. Browse use on this species was light in 1983 and 1989, light-moderate in 1997, and moderate-heavy in 2002. In 2007, browse use was split between light and heavy.

The canopy cover of mountain big sagebrush has been approximately 3% since 2002. Sagebrush density has also oscillated between increasing and decreasing in alternate sample years. The lowest mountain big sagebrush density was 560 plants/acre (1,386 plants/ha) in 2002, and the highest was 1,540 plants/acre (3,812 plants/ha) in 1997. In 2007, the density was estimated at 580 plants/acre (1,435 plants/ha). Seedlings were not measured until 2007 and had a density of 160 plants/acre (396 plants/ha). Young plants increased from 6% of the population in 1983 to 57% in 1997, decreased to 0% in 2002, and increased to 34% in 2007. Decadence was high in 1983 (19%), 1989 (50%), and in 2002 (21%), but was 10% or less in 1997 and 2007. There were no dead plants measured prior to 1997, but since then dead plant density has ranged from 140 plants/acre (347 plants/ha) to 300 plants/acre (743 plants/ha). The proportion of plants exhibiting poor vigor increased from 13% in 1983 to 17% in 1989, then decreased to 3% by 2007. In 2002 and 2007, all of the plants with poor vigor were classified as dying. Annual sagebrush leader growth averaged 1.8 inches (4.6 cm) in 2002 and 2007. Browse use was moderate in 1983 and has been light all other sample years.

Curl-leaf mountain mahogany (*Cercocarpus ledifolius*) and true mountain mahogany (*Cercocarpus montanus*) are also present, but have low abundance. Curl-leaf mahogany occurs as large, scattered plants on the hillslope above the transect and canopy cover has averaged 7% since 2002. The site supports many other less preferred browse, including: Martin ceanothus (*Ceanothus martinii*), stickyleaf low rabbitbrush (*Chrysothamnus viscidiflorus* ssp. *viscidiflorus*), whorled buckwheat (*Eriogonum heracleoides*), Oregon grape (*Mahonia repens*), mountain lover (*Pachistima myrsinites*), and Woods' rose (*Rosa woodsii*). Some of these species have seen drastic oscillations in density, due in part to the increased sample area used since 1997. In 2002, many of the browse species had been defoliated by a combination of drought and crickets.

Herbaceous Understory

The grass understory has been diverse and abundant. Between seven and 12 grass species have been measured throughout all sample years. Nested frequency data indicate that perennial grasses have been in decline since 1997. Cover data reflect the same decline from 1997 through 2007. Perennial grass cover was 17% in 1997 and decreased to 7% in 2007. The most abundant perennial species are oniongrass (*Melica bulbosa*), spike fescue (*Leucopoa kingii*), mutton bluegrass (*Poa fendleriana*), and mountain brome (*Bromus carinatus*). Cheatgrass (*Bromus tectorum*) was sampled in 1% of quadrats in 1997, and 3% in 2007.

As this is summer range, forbs are especially important to deer, so forb density and composition quality are crucial. Perennial forb cover was 7% in 1997, 2% in 2002, and 13% in 2007. The most abundant perennial species have been wild onion (*Allium* sp.), tapertip hawkbeard (*Crepis acuminata*), ballhead waterleaf (*Hydrophyllum capitatum*), silky lupine (*Lupinus sericeus*), longleaf phlox (*Phlox longifolia*), and mulesear wyethia (*Wyethia amplexicaulis*). The number of perennial forb species measured has been fairly stable, except in 2002. Between 20 and 24 species were sampled in 1983, 1989, 1997, and 2007, and only nine species were measured in 2002. The decrease in 2002 was likely the result of drought conditions.

1989 TREND ASSESSMENT

The browse trend is slightly up. The density of serviceberry increased nearly three-fold, but sagebrush density decreased 25%. Decadence in both species increased; from 0% to 26% for serviceberry, and from 19% to 50% for sagebrush. None of the decadent plants were classified as dying and there was an increase in young plants for both species. The proportion of plants exhibiting poor vigor remained 0% for serviceberry and increased from 13% to 17% for sagebrush. Serviceberry use remained light and that of sagebrush changed from moderate to light. The grass trend is up. The sum of nested frequency of perennial grasses increased 51%, including significant increases in the nested frequencies of five species. The forb trend is up. The sum of

nested frequency of perennial forbs increased 45%. There was a significant increase in the nested frequencies of five forb species, and a significant decreases in the nested frequency of three.

browse - slightly up (+1)

grass - up (+2)

forb - up (+2)

1997 TREND ASSESSMENT

The browse trend is slightly up. Serviceberry density decreased 56%, but sagebrush density increased 93%. Some of the change in shrub density is attributed to the larger area sampled beginning in 1997. Therefore, the trend assessment was based more heavily on other parameters. For example, the young age class remained constant for serviceberry at 11%, and increased more than three-fold for sagebrush (from 17% to 57%). The density of young sagebrush was much higher than the densities of decadent and dead plants. Serviceberry decadency decreased from 26% to 4% and sagebrush decadence decreased from 50% to 8% of the population. The proportion of plants exhibiting poor vigor remained constant for serviceberry and decreased from 17% to 13% for sagebrush. Browse use was light-moderate for both species. The grass trend is stable. The sum of nested frequency of perennial grasses decreased 9%, including a significant decrease in the nested frequency of slender wheatgrass (*Agropyron trachycaulum*). The forb trend is down. The sum of nested frequency of perennial forbs decreased 57%, including significant decreases in the nested frequencies of seven species. The Desirable Components Index (DCI) score was not computed for this summer range study.

winter range condition (DCI) - Not applicable, summer range

browse - slightly up (+1)

grass - stable (0)

forb - down (-2)

2002 TREND ASSESSMENT

The browse trend is down. The density of serviceberry increased 43% and sagebrush density decreased 64%. There were no seedlings of either species and the young plant component of both populations decreased. The high number of young sagebrush plants that were sampled in 1997 did not reach maturity. All of the decrease in sagebrush density was from the young and mature age classes. The serviceberry population had no decadent plants, but sagebrush decadence increased from 8% to 21% of the population. The proportion of serviceberry plants exhibiting poor vigor increased from 0% to 38% and remained nearly constant for sagebrush. Browse use on serviceberry shifted to moderate-heavy and remained light for sagebrush. The grass trend is slightly down. The sum of nested frequency of perennial grasses decreased 9% for the second consecutive sample year. Additionally, the number of species decreased from 12 to seven. The forb trend is down. The sum of nested frequency of perennial forbs decreased 89%, and the total number of species decreased from 26 to nine. The DCI score was not computed for this summer range study.

winter range condition (DCI) - Not applicable, summer range

browse - down (-2)

grass - slightly down (-1)

forb - down (-2)

2007 TREND ASSESSMENT

The browse trend is slightly down. The density of serviceberry decreased 38%, while sagebrush density increased only 4%. The loss of serviceberry plants was largely from the mature age class. Decadence increased from 0% to 12% for serviceberry, and decreased from 21% to 10% for sagebrush. Seedling sagebrush plants were measured for the first time and the young age class increased from 0% to 34% of the population. Young serviceberry plants also increased. For both browse species, the proportion of plants exhibiting poor vigor returned to low levels. Browse use on serviceberry was almost evenly divided between light and heavy, and remained light on sagebrush. The grass trend is down. The sum of nested frequency of perennial grasses decreased 38%, including significant decreases in the nested frequencies of spike fescue, oniongrass, and mutton bluegrass. The number of sampled grass species slightly increased from seven to eight. The forb trend is up. The sum of nested frequency increased nearly nine-fold and the number of

species increased from nine to 27. Perennial forb cover increased from 2% to 16%. The DCI score was not computed for this summer range study.

winter range condition (DCI) - Not applicable, summer range

browse - slightly down (-1)

grass - down (-2)

forb - up (+2)

HERBACEOUS TRENDS --

Management unit 19B, Study no: 4

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
G	Agropyron spicatum	_a 1	_b 29	_{ab} 16	_{ab} 13	_b 29	.49	.40	.43
G	Agropyron trachycaulum	_a 8	_b 61	_a 6	-	-	.06	-	-
G	Bromus carinatus	_a 44	_b 81	_b 103	_{ab} 61	_{ab} 71	3.81	1.21	3.04
G	Bromus tectorum (a)	-	-	_a 2	-	_a 5	.00	-	.06
G	Carex sp.	-	-	-	4	-	-	.38	-
G	Festuca ovina	-	-	3	-	-	.03	-	-
G	Leucopoa kingii	_a 41	_a 61	_b 114	_b 107	_a 33	5.06	4.92	.91
G	Melica bulbosa	_b 243	_b 224	_b 179	_b 197	_a 112	6.02	5.75	2.07
G	Poa fendleriana	_a 16	_{ab} 28	_{bc} 46	_c 75	_{ab} 27	1.27	1.32	.68
G	Poa pratensis	_a 6	_b 26	_{ab} 20	_a 2	-	.26	.03	-
G	Poa secunda	_a 2	_b 26	_{ab} 13	-	_a 6	.24	-	.06
G	Stipa columbiana	_a 1	_a 11	_a 1	-	-	.00	-	-
G	Stipa lettermani	_a 4	_a 6	_a 1	-	_a 8	.00	-	.01
Total for Annual Grasses		0	0	2	0	5	0.00	0	0.06
Total for Perennial Grasses		366	553	502	459	286	17.27	14.03	7.22
Total for Grasses		366	553	504	459	291	17.28	14.03	7.29
F	Agoseris glauca	_b 15	_a 2	-	-	_{ab} 5	-	-	.01
F	Alyssum alyssoides (a)	-	-	_a 19	-	_a 20	.07	-	.23
F	Allium sp.	_a 87	_b 124	_{ab} 118	-	_{ab} 115	.52	-	1.17
F	Arabis sp.	-	-	2	-	-	.01	-	-
F	Aster chilensis	_a 20	_b 84	_a 7	-	_a 5	.03	-	.06
F	Astragalus cibarius	_a 10	_a 5	_a 1	-	-	.00	-	-
F	Balsamorhiza hookeri	3	-	-	-	-	-	-	-
F	Balsamorhiza sagittata	-	-	-	_a 1	_a 4	-	.18	.53
F	Castilleja linariaefolia	-	-	-	-	1	-	-	.00
F	Calochortus nuttallii	-	_a 3	_a 7	-	_a 3	.02	-	.00
F	Chaenactis douglasii	-	-	1	-	-	.00	-	-
F	Cirsium sp.	-	_a 12	_a 1	-	-	.23	-	-
F	Collomia linearis (a)	-	-	_a 38	-	_a 54	.09	-	.45
F	Collinsia parviflora (a)	-	-	_a 31	-	_b 164	.08	-	1.21

Type	Species	Nested Frequency					Average Cover %		
		'83	'89	'97	'02	'07	'97	'02	'07
F	<i>Crepis acuminata</i>	_b 65	_c 143	_b 46	-	_a 3	.56	-	.01
F	Cruciferae	-	30	-	-	-	-	-	-
F	<i>Delphinium nuttallianum</i>	-	-	_a 4	_a 3	-	.01	.03	-
F	<i>Epilobium brachycarpum</i> (a)	-	-	-	-	18	-	-	.21
F	<i>Erigeron eatonii</i>	_b 22	_{ab} 16	-	-	3	-	-	.00
F	<i>Eriogonum racemosum</i>	_{ab} 14	_b 17	_{ab} 20	_a 3	_{ab} 6	.55	.06	.07
F	<i>Eriogonum umbellatum</i>	_c 53	_b 32	_a 3	_a 2	_a 2	.00	.00	.00
F	<i>Fritillaria pudica</i>	_a 5	_a 7	-	-	-	-	-	-
F	<i>Hackelia patens</i>	_a 5	-	_a 2	-	_a 3	.00	-	.03
F	<i>Helianthella uniflora</i>	_a 9	_a 9	-	_a 2	-	-	.15	-
F	<i>Hydrophyllum capitatum</i>	_b 35	_a 3	-	-	_c 99	-	-	5.08
F	<i>Lomatium</i> sp.	_a 15	_a 30	_a 27	-	_a 14	.18	-	.15
F	<i>Lupinus sericeus</i>	_b 155	_b 160	_a 68	-	_a 25	1.45	-	.79
F	<i>Machaeranthera canescens</i>	_a 1	_a 8	_a 3	-	_a 3	.00	-	.03
F	<i>Microsteris gracilis</i> (a)	-	-	_a 10	-	_a 5	.05	-	.01
F	<i>Penstemon caespitosus</i>	-	_a 2	_a 3	-	-	.00	-	-
F	<i>Penstemon humilis</i>	-	-	-	-	9	-	-	.09
F	<i>Petroradia pumila</i>	-	-	-	-	-	-	.00	-
F	<i>Phlox longifolia</i>	_a 47	_b 87	_a 37	-	_a 26	.22	-	.20
F	<i>Polygonum douglasii</i> (a)	-	-	_b 85	_a 2	_b 61	.41	.00	.42
F	<i>Senecio integerrimus</i>	-	_b 26	-	_a 3	_a 4	-	.03	.05
F	<i>Taraxacum officinale</i>	-	_b 19	_a 3	-	-	.03	-	-
F	<i>Veronica biloba</i> (a)	-	-	_a 1	-	_a 3	.00	-	.03
F	<i>Viola</i> sp.	_a 2	_a 3	-	_a 1	_a 3	-	.00	.03
F	<i>Wyethia amplexicaulis</i>	_b 49	_c 74	_{ab} 35	_a 27	_{ab} 35	2.80	1.05	4.80
F	<i>Zigadenus paniculatus</i>	_a 7	_a 1	_a 2	-	-	.03	-	-
Total for Annual Forbs		0	0	184	2	325	0.72	0.00	2.59
Total for Perennial Forbs		619	897	390	42	368	6.71	1.52	13.15
Total for Forbs		619	897	574	44	693	7.43	1.52	15.75

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Management unit 19B, Study no: 4

Type	Species	Strip Frequency			Average Cover %		
		'97	'02	'07	'97	'02	'07
B	Amelanchier alnifolia	21	27	20	3.65	4.08	3.48
B	Artemisia tridentata vaseyana	30	22	18	1.87	3.67	2.00
B	Cercocarpus ledifolius	0	1	1	.45	-	.53
B	Ceanothus martinii	9	0	0	.60	-	-
B	Cercocarpus montanus	0	1	1	-	-	.03
B	Chrysothamnus nauseosus albicaulis	3	0	0	-	-	-
B	Chrysothamnus viscidiflorus viscidiflorus	20	11	6	1.19	.13	.06
B	Eriogonum heracleoides	22	33	23	1.49	1.08	1.53
B	Mahonia repens	16	13	17	.78	.45	.33
B	Pachistima myrsinites	0	9	9	-	.64	.39
B	Rosa woodsii	10	7	12	.06	.09	.40
B	Symphoricarpos oreophilus	55	71	65	22.89	19.06	20.27
Total for Browse		186	195	172	32.99	29.23	29.04

CANOPY COVER, LINE INTERCEPT --

Management unit 19B, Study no: 4

Species	Percent Cover		
	'97	'02	'07
Amelanchier alnifolia	-	6.25	7.88
Artemisia tridentata vaseyana	-	3.48	2.01
Cercocarpus ledifolius	1.00	6.36	7.33
Cercocarpus montanus	-	-	.18
Chrysothamnus viscidiflorus viscidiflorus	-	.18	.05
Eriogonum heracleoides	-	2.56	.61
Mahonia repens	-	.41	.61
Pachistima myrsinites	-	.76	.38
Rosa woodsii	-	.36	.85
Symphoricarpos oreophilus	-	25.54	33.18

KEY BROWSE ANNUAL LEADER GROWTH --

Management unit 19B, Study no: 4

Species	Average leader growth (in)	
	'02	'07
Amelanchier alnifolia	1.9	4.1
Artemisia tridentata vaseyana	1.8	1.8
Cercocarpus ledifolius	2.5	1.7

BASIC COVER --

Management unit 19B, Study no: 4

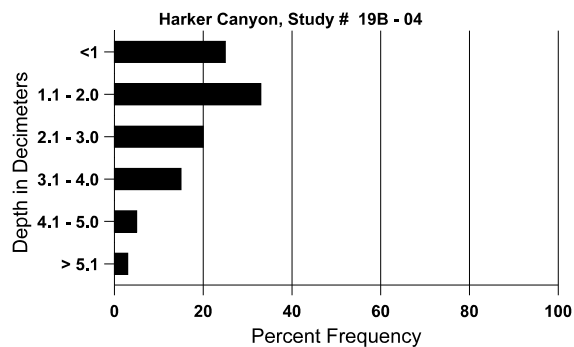
Cover Type	Average Cover %				
	'83	'89	'97	'02	'07
Vegetation	1.75	18.50	61.45	41.98	49.82
Rock	3.50	5.50	4.61	9.05	6.51
Pavement	3.00	4.50	2.66	9.95	7.61
Litter	72.25	61.50	65.00	36.07	27.82
Cryptogams	.25	0	.01	.38	0
Bare Ground	19.25	10.00	2.91	23.61	17.22

SOIL ANALYSIS DATA --

Herd Unit 19B, Study no: 4, Harker Canyon

Effective rooting depth (in)	Temp °F (depth)	pH	Loam			%OM	ppm P	ppm K	dS/m
			%sand	%silt	%clay				
13.1	54.0 (14.3)	6.0	46.3	31.1	22.6	5.4	21.2	342.4	.6

Stoniness Index



PELLET GROUP DATA --

Management unit 19B, Study no: 4

Type	Quadrat Frequency		
	'97	'02	'07
Elk	2	-	3
Deer	6	11	4
Cattle	-	5	3

Days use per acre (ha)	
'02	'07
1 (3)	1 (2)
40 (99)	25 (63)
10 (25)	5 (13)

BROWSE CHARACTERISTICS --

Management unit 19B, Study no: 4

		Age class distribution (plants per acre)					Utilization					
Y	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
<i>Amelanchier alnifolia</i>												
83	333	-	-	333	-	-	0	0	0	-	0	39/35
89	1266	-	133	800	333	-	0	0	26	-	0	55/31
97	560	-	60	480	20	-	25	4	4	-	0	55/51
02	800	-	40	760	-	-	25	45	0	-	38	47/43
07	500	-	80	360	60	-	8	44	12	4	4	51/48
<i>Artemisia tridentata vaseyana</i>												
83	1066	-	66	800	200	-	69	0	19	-	13	26/30
89	799	-	133	266	400	-	0	0	50	-	17	24/39
97	1540	-	880	540	120	240	3	1	8	3	13	26/33
02	560	-	-	440	120	300	0	0	21	11	11	22/35
07	580	160	200	320	60	140	17	3	10	3	3	22/40
<i>Cercocarpus ledifolius</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	157/177
02	20	-	-	20	-	-	0	0	-	-	0	161/236
07	20	-	-	20	-	-	0	0	-	-	0	143/223
<i>Ceanothus martinii</i>												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	580	-	260	320	-	-	3	0	-	-	0	8/18
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Cercocarpus montanus												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	20	-	-	20	-	-	0	0	-	-	100	51/70
07	20	-	-	20	-	-	0	0	-	-	0	61/76
Chrysothamnus nauseosus albicaulis												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	80	-	80	-	-	-	25	50	-	-	25	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Chrysothamnus viscidiflorus viscidiflorus												
83	666	-	-	666	-	-	0	0	0	-	0	12/10
89	666	-	133	533	-	-	0	0	0	-	0	16/14
97	760	-	160	600	-	-	0	0	0	-	0	16/17
02	260	-	-	120	140	20	0	0	54	31	38	10/12
07	160	-	-	160	-	-	50	0	0	-	0	11/19
Cowania mexicana stansburiana												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	11/70
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Eriogonum heracleoides												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	0	-	-	-	-	-	0	0	0	-	0	-/-
97	920	-	-	920	-	20	0	0	0	-	0	15/14
02	1560	-	-	1380	180	20	21	5	12	4	10	7/14
07	780	80	-	760	20	-	0	21	3	-	3	5/12
Mahonia repens												
83	666	-	-	666	-	-	0	0	0	-	0	8/7
89	532	-	-	466	66	-	0	0	12	-	13	3/3
97	2180	-	300	1880	-	-	0	0	0	-	0	4/6
02	1040	-	-	1040	-	-	0	0	0	-	0	3/4
07	3600	-	140	3460	-	-	0	0	0	-	0	3/4

		Age class distribution (plants per acre)					Utilization					
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% dying	% poor vigor	Average Height Crown (in)
Opuntia sp.												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	-/-
07	0	-	-	-	-	-	0	0	-	-	0	4/18
Pachistima myrsinites												
83	400	-	-	400	-	-	0	0	0	-	0	16/49
89	14732	1066	6466	7000	1266	-	16	6	9	.45	1	10/9
97	0	-	-	-	-	-	0	0	0	-	0	-/-
02	880	-	180	700	-	-	7	0	0	-	0	3/6
07	880	-	240	640	-	-	23	14	0	-	0	4/9
Purshia tridentata												
83	0	-	-	-	-	-	0	0	-	-	0	-/-
89	0	-	-	-	-	-	0	0	-	-	0	-/-
97	0	-	-	-	-	-	0	0	-	-	0	-/-
02	0	-	-	-	-	-	0	0	-	-	0	35/61
07	0	-	-	-	-	-	0	0	-	-	0	-/-
Rosa woodsii												
83	0	-	-	-	-	-	0	0	0	-	0	-/-
89	0	-	-	-	-	-	0	0	0	-	0	-/-
97	880	20	480	400	-	-	0	0	0	-	0	9/8
02	420	20	100	320	-	-	0	0	0	-	0	9/8
07	880	-	-	860	20	-	0	7	2	-	2	10/10
Symphoricarpos oreophilus												
83	1000	-	-	1000	-	-	0	0	0	-	0	32/31
89	2132	200	533	866	733	-	0	0	34	-	3	27/35
97	2620	-	200	2360	60	-	0	0	2	2	2	33/64
02	3000	-	20	2720	260	-	.66	0	9	-	24	27/45
07	2480	-	20	2160	300	20	3	0	12	.80	16	30/52